

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

LP MATTHEWS, L.L.C.,

Plaintiff,

v.

BATH & BODY WORKS, INC.; LIMITED
BRANDS, INC.; KAO BRANDS CO.
(f/k/a THE ANDREW JERGENS
COMPANY); and KAO CORPORATION,

Defendants.

REDACTED PUBLIC VERSION

C.A. No. 04-1507-SLR

LP MATTHEWS' OPENING CLAIM CONSTRUCTION BRIEF

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NATURE AND STAGE OF PROCEEDINGS

On December 8, 2004, plaintiff LP Matthews, L.L.C. ("LP Matthews") filed a Complaint for patent infringement against defendants Kao Brands Company (formerly known as The Andrew Jergens Company), Kao Corporation, Limited Brands, Inc., and Bath & Body Works, Inc. (D.I. 1.) LP Matthews amended its Complaint on February 2, 2005. (D.I. 5, 8.) This Court entered a Scheduling Order on June 9, 2005. (D.I. 39.) Pursuant to the Scheduling Order, the parties filed a Joint Claim Construction Statement on June 15, 2006 (D.I. 228). Simultaneous opening claim construction briefs are to be filed on June 29, 2006. (D.I. 39 at 5.)

INTRODUCTION

LP Matthews submits this brief in support of its proposed construction of the claim terms at issue in this litigation. Claim interpretation "must begin and remain centered on the language of the claims themselves." *Interactive Gift Express, Inc. v. CompuServe, Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001). "The general rule is that terms in the claim are to be given their ordinary and accustomed meaning." *K-2 Corp. v. Salomon S.A.*, 191 F.3d 1356, 1362-63 (Fed. Cir. 1999); *see also Jansen v. Rexall Sundown, Inc.*, 342 F.3d 1329, 1333 (Fed. Cir. 2003) ("ordinary meaning of the claim language"); *National Recovery Techs., Inc. v. Magnetic Separation Sys., Inc.*, 166 F.3d 1190, 1195 (Fed. Cir. 1999) ("language of the claim").

There are two claims of United States Patent No. 5,063,062 ("the '062 patent") at issue in this litigation – claims 6 and 9 (italicized boldface terms to be construed):

6. *A skin cleaning composition for external use on human tissues, comprising orange oil, a pharmaceutically acceptable moisturizer for human skin and an oat grain derivative product as an emulsifying agent, wherein said composition has a pH within a range of 4.5 to 6.0, inclusively.*

9. ***A cleaning composition for use on human skin comprising forty-five percent (45%) or less by volume of orange oil, forty-five percent (45%) or less by volume of oatmeal and a pharmaceutically acceptable moisturizer.***

As stated in the Joint Claim Construction Statement, this Court needs to construe the following terms in claim 6: (1) "skin cleaning composition for external use on human tissues"; (2) "orange oil"; (3) "oat grain derivative product"; (4) "emulsifying agent"; (5) "pharmaceutically acceptable moisturizer"; and (6) "pH within a range 4.5 to 6.0, inclusively." This Court also needs to construe the following terms in claim 9: (1) "cleaning composition for use on human skin"; (2) "forty-five percent (45%) or less by volume of orange oil"; (3) "oatmeal"; and (4) "pharmaceutically acceptable moisturizer."

Each of these terms should be accorded their ordinary and customary meaning to a person of ordinary skill in the art in 1989, when the application for the patent-in-suit was filed. Accordingly, a cleaning composition is a composition that cleans human skin. Orange oil is oil derived from an orange. An oat grain derivative product is a product derived from oat grain. Oatmeal is material that is derived from the kernel of an oat grain (i.e., processed oat kernel). An emulsifying agent is an ingredient that has a stabilizing effect on an emulsion (a mixture of two immiscible liquids (e.g., oil and water)). A pharmaceutically acceptable moisturizer is a product that attracts water or prevents water loss and is safe for use by human beings. pH is a measure of the acidity or alkalinity of a solution at the level of precision attained using colorimetric techniques in 1989. Forty-five percent or less by volume is more than zero percent but not more than forty-five percent of the volume of a composition. These are commonly used terms with ordinary and customary meanings as demonstrated by the undisputed testimony of defendants' witnesses.

BACKGROUND

The United States Patent and Trademark Office (“PTO”) issued United States Patent No. 6,063,062 (“the ‘062 patent”) to Douglas Greenspan and Philip Low on November 5, 1991. The application for the ‘062 patent was filed on September 27, 1989 and, as demonstrated by, *inter alia*, the deposition testimony of inventor Mr. Low, the patented invention was invented in December of 1988.

The ‘062 patent claims compositions for cleaning human skin that contain orange oil, an oat ingredient, and a moisturizer. (Ex. A, ‘062 Patent, at 9:3-10:25). The invention “provide[s] a skin cleaning composition that not only removes unwanted substances from the human skin, but also acts to help clean and revitalize the human skin.” (*Id.* at 2:21-25.) The inventors, Mr. Greenspan and Mr. Low, tested the “skin effecting property” (*id.* at 6:62-64), “softening effect” (*id.* at 2:68), and “cleaning properties” (*id.* at 1:24-28, 6:30-31) of their invention. They identified an intended use in the preambles – skin cleaning – and used the open-ended transitional phrase “comprising” in the claims. (*Id.* at 4:19-20, 66-67.)

The clear language of claims 6 and 9 claim a composition that cleans human skin and contains orange oil, an oat element, and a moisturizer, and may contain other ingredients because the transitional phrase “comprising” is used in the claims. The inventors plainly contemplated varying combinations of ingredients with differing functions. For example, the inventors noted that glycerin or safflower oil act as both moisturizers and emulsifying agents. (*Id.* at 8:14-19.) As further example, oatmeal adds cleaning properties. (Exhibit B, ‘062 patent prosecution history at LPM 000186.) As another example, the embodiments disclosed in the ‘062 patent specification included compositions with baking soda, Vitamin E, and multiple moisturizers (Ex. A, ‘062 patent at 7:10-57.)

The preamble of both claims at issue limits the claimed compositions to cleaning compositions for use on human skin, i.e., compositions that treat an unwanted substance on the skin in order to facilitate removal of those substances by some other mechanism, such as rinsing, wiping, rubbing, or shearing. (A cleaning composition need not both treat the substance and remove it.) None of the claim elements were amended during prosecution.

With respect to the orange oil, Greenspan and Low observed that in its “broadest form,” the “composition includes orange oil.” (*Id.* at 2:68.) Orange oil is oil derived from the an orange (any reddish-yellow fruit of the genus *Citrus*, including Mandarin Oranges (*Citrus nobilis*)). With respect to oat grain derivative products and oatmeal, Mr. Greenspan testified that it was his understanding, as a person of ordinary skill in the art, that oatmeal is ground or processed oat grain product. (Exhibit C, Greenspan Dep. Tr. at 98: 4-5.) His testimony confirms the description of oatmeal in the '062 patent as processed boiled rolled oats (ex. A, '062 patent at 4:55-60) and is also consistent with the testimony of BBW's 30(b)(6) designee, a person of ordinary skill in the art.

With respect to the moisturizer element, that is a product that attracts water or prevents water loss. (Exhibit E, Rhodes Expert Report at 5.) A pharmaceutically acceptable moisturizer is one that is generally accepted as safe for topical use in pharmaceutical or cosmetic products. (*Id.*) The exemplary moisturizers described in the '062 patent specification include glycerin stearate, aloe vera, jojoba oil, safflower oil, or those that could be developed without undue experimentation by the ordinarily skilled chemist. (Ex. A, '062 patent at 8:47-52.)

LEGAL ARGUMENT

I. Controlling Legal Standards for Claim Construction

Claim construction is a question of law. *Markman v. Westview Instr., Inc.*, 52 F.3d 967,

976 (Fed. Cir. 1995), 52 F.3d at 977-79. A “bedrock principle” of patent law is that “the claims of a patent define the invention to which the patentee is entitled the right to exclude.”

Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc., 381 F.3d 1111, 1115 (Fed. Cir. 2004). Claim construction, therefore, begins with the claim language. *Vitronics Corp. v. Conceptoronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996).

Words of a claim are “generally given their ordinary and customary meaning.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (quoting *Vitronics*, 90 F.3d at 1582). “The ordinary and customary meaning” is determined at the time of the invention to one skilled in the art after reading the patent at issue. *Home Diagnostics, Inc. v. Lifescan Inc.*, 381 F.3d 1352, 1355-56 (Fed. Cir. 2004); *see also Phillips*, 415 F.3d at 1313 (“The ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.”).

For guidance, the Court should look to the words surrounding a claim term because its context can help determine ordinary and customary meaning. *Phillips*, 415 F.3d at 1314. Additionally, the same claim terms appearing in multiple claims should always be construed consistently. *Innova/Pure Water*, 381 F.3d at 1119.

The claims, however, should not be considered in a vacuum. *Phillips*, 415 F.3d at 1315. They “must be read in view of the specification, of which they are a part.” *Markman*, 52 F.3d at 979. However, the claims should not be limited to the preferred embodiments, and it is axiomatic that claims are only rarely, if ever, construed as limited to the preferred embodiment. *See, e.g., Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 992 (Fed. Cir. 1999).

In addition to the specification, the Court should examine the prosecution history (or “file

wrapper”). *Phillips*, 415 F.3d at 1317. The Federal Circuit has declared that the prosecution history “is often of critical significance in determining the meaning of the claims.” *Vitronics*, 90 F.3d at 1582. It provides evidence of how the inventor understood the invention. *Phillips*, 415 F.3d at 1317. Like the specification, the prosecution history also acts as a dictionary of claim terms. Statements made during the prosecution of the patent may limit the interpretation of claims so as to exclude any interpretation that was disavowed in order to claim allowance. *Rheox, Inc. v. Entact, Inc.*, 276 F.3d 1319, 1325 (Fed. Cir. 2002); *see also Phillips*, 415 F.3d at 1317 (stating that the prosecution history can reveal whether the inventor “limited the invention in the course of prosecution”).

An analysis of the intrinsic evidence – the claims, the specification, and the prosecution history – will frequently resolve any ambiguity in a disputed claim term. *Vitronics*, 90 F.3d at 1583. However, as the Federal Circuit clarified in *Phillips*, this Court, in its sound discretion, may admit and use extrinsic evidence. 415 F.3d at 1318. The Federal Circuit noted that extrinsic evidence may, for example, “shed useful light on the relevant art.” *Id.* at 1317 (quoting *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 862 (Fed. Cir. 2004)). *See, e.g., Pfizer, Inc. v. Teva Pharms. USA Inc.*, 429 F.3d 1364, 1375 (Fed. Cir. 2005) (affirming claim construction and approving of district court's consideration of extrinsic evidence).

II. This Court Should Adopt LP Matthews's Proposed Construction of Disputed Claim Terms Because It Is Consistent With The Ordinary and Customary Meaning of the Terms.

LP Matthews has advanced a construction for each term that resorts to the plain meaning of the claim language read in light of the intrinsic record. In so doing, LP Matthews has been guided by the Federal Circuit's reminder that “[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.” *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243,

1250 (Fed. Cir. 1998).

“[A] party wishing to alter the meaning of a clear claim term must overcome the presumption that the ordinary and accustomed meaning is the proper one, *demonstrating why such alteration is required.*” *K-2*, 191 F.3d at 1362-63 (emphasis added); *see also Leibel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (“The claims of a patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope.”). Because “the claim language is clear on its face,... consideration of the rest of the intrinsic evidence is restricted to determining if a deviation from the clear language of the claims is specified....” *Interactive Gift Express, Inc. v. CompuServe, Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001) (emphasis added) (reversing summary judgment of non-infringement where district court improperly imported limitations from the specification); *see also Gart v. Logitech, Inc.*, 254 F.3d 1334, 1341 (Fed. Cir. 2001) (finding district court improperly imported limitation from patent figures that illustrated preferred embodiment); *Digital Biometrics, Inc. v. Identix, Inc.*, 149 F.3d 1335, 1344 (Fed. Cir. 1998) (“Within the intrinsic evidence...there is a hierarchy of analytical tools. The actual words of the claim are the controlling focus.”).

As demonstrated below, the claim construction proposed by LP Matthews is consistent with the ordinary and customary meaning of these terms to a person of ordinary skill in the art in 1989 and as those terms are used in the '062 patent and prosecution history, without incorporating limitations from the specification or improperly restricting the claims to the preferred embodiments.

A. "Skin Cleaning Composition for External Use on Human Tissues" and "Cleaning Composition for Use on Human Skin"

The term “cleaning composition” appears in the preambles of claims 6 and 9. “[A] patent grants the right to exclude others from making, using, selling, offering to sale, or importing the

claimed apparatus or composition for any use of that apparatus or composition, whether or not the patentee envisioned such use.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 809 (Fed. Cir. 2002) (citing 35 U.S.C. §271 (1994) and *Roberts v. Ryer*, 91 U.S. 150, 157 (1875)). In this case, the applicants “define[d] a structurally complete invention in the claim body and use[d] the preamble only to state a purpose or intended use for the invention.” *Catalina Mktg.*, 289 F.3d at 808 (citation and internal quotes omitted).

Asserted claims 6 and 9 of the ‘062 patent claim compositions that have a cleaning effect on human skin. This is the ordinary and customary meaning to a person of ordinary skill in the art. As Dr. Rhodes testified,

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REDACTED (Ex. F, Rhodes Dep. Tr. at 134: 15-16). Dr. Rhodes further testified that

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(*id.* at 135: 1-3), and that there is no significant difference between the two preambles. (*Id.* at 135:10-11.)

“Cleaning” means treating unwanted substances on the skin in order to facilitate removal of those substances (for example, loosening or dissolving or drawing or sheering substances such as dead skin, dirt, oil, blemishes (*e.g.* ashen coloration) etc...). The unwanted substances can then be removed by rinsing, wiping, abrasion or evaporation. For example, the ‘062 patent specification discloses that the preferred embodiment was tested by washing with water and applying to a towellet that was “particularly useful in situations where water is not readily available.” (Ex. A, ‘062 patent at 8:24-36.)

The claims of the ‘062 patent do not call for a particular quantity or quality of the cleaning effect. Nor do they require that orange oil be the only cleaning component. For example, the oat grain derivative product may contribute to the cleaning effect of the

composition. (Ex. B at LPM 000186.) Because the patentees used the open transitional phrase "comprising," the claimed composition may have other effects besides cleaning and may include other cleaning components. Indeed, the specification of the '062 patent states objects of the invention that include other effects, *e.g.*, softening and rejuvenating the skin. This softening effect was not incidental to the invention. For example, the 45% limitation on orange oil was arrived at because "any amount of orange oil in excess of this amount would result in the diminishment of moisturizers so as to negate the softening effect" (Ex. A, '062 patent at 7:23-26.)

Accordingly, the preambles should be construed to mean compositions that treat unwanted substances on the skin in order to facilitate removal of those substances.

B. "Orange Oil" and "Forty-five percent (45%) or Less By Volume of Orange Oil"

Claim 6 simply requires "orange oil" without any percentage limitations. The plain meaning of orange oil is the oil (*i.e.*, non-water soluble liquid) derived from an orange, as by (for example) cold pressing or processing oranges or orange rinds. (Ex. A, '062 patent at 2:66-67; Ex. F, Rhodes Dep. Tr. at 252:8-16). An orange is a globose, reddish-yellow, bitter or sweet, edible citrus fruit from any of the white-flowered rutaceous trees of the genus *Citrus*. (Ex. G, Random House College Dictionary 934 (1972).) Orange oil contains numerous molecular species, including esters and other volatiles. (Ex. F, Rhodes Dep. Tr. at 265:9-15; Ex. B at LPM 000184.)

Neither claim 6 nor claim 9 recites a minimum percentage of orange oil in the composition. (Ex. A at 10:1-6, 13-17.) Claim 6 of the '062 patent claims a composition "comprising orange oil." (*Id.* at 10:1-6.) Claim 9 requires "forty-five percent (45%) or less by volume of orange oil." The plain meaning of the 45% or less range in claim 9 reaches to the

endpoints of the range recited in the claim. *See Talbert Fuel Sys. Patents Co. v. Unocal Corp.*, 275 F.3d 1371, 1375 (Fed. Cir. 2002) (“We agree with the district court that the plain meaning of a boiling point range...is that the range limits the composition to that stated in the claim.”). The specification of the '062 patent does not limit the claims to a minimum orange oil percentage either. For example, as stated in the '062 patent specification, “the more specific composition according to the preferred embodiment ... comprises forty-five percent (45%) or less by volume of orange oil” (Ex. A, '062 patent at 2:45-48.)

In contrast to claims 6 and 9, claim 1 was drafted to require at least 5% orange oil: “between five percent (5%) and sixty percent (60%) orange oil....” (*Id.* at 9:4-10.) Claim 1 includes a numerical limitation of 5%, but claims 6 and 9 do not. “It is usually incorrect to read numerical precision into a claim from which it is absent, *particularly when other claims contain the numerical limitation.*” *Modine Mfg. Co. v. United States Int'l Trade Comm'n*, 75 F.3d 1545, 1551 (Fed. Cir. 1996) (emphasis added).

Properly construed, claim 6 and claim 9 require only that the accused product contain oil derived from an orange and require only enough of that ingredient to have a cleaning effect. A person of ordinary skill in the art at the time of the invention would have known that orange oil has a cleaning effect at 0.01%. United States Patent No. 5,013,485 (“the '485 patent”) teaches that 0.01 percent orange oil or more acts as a solvent and has a cleaning effect. (Ex. H, '485 patent at 3:5-8.) Furthermore, a person of ordinary skill in the art would have known that an ingredient that effectively cleans difficult to remove substances such as cosmetics at a relatively high concentration would both clean less difficult to remove substances at lower concentrations or clean difficult to remove substances with longer application. (Ex. F, Rhodes Dep. Tr. at 159:14-160:11.) In addition, a person of ordinary skill in the art with “knowledge of the use of

surfactants and of solvents, knowing that surfactants in particular are very active even at very low concentrations, [would] ... know that the limits of the effectiveness of the teachings of the '062 patent are going to be much lower than 5 percent." (*Id.* at 160:13-18.)

Accordingly, orange oil is a non-water soluble liquid derived from an orange and present at a concentration of at least 0.01%.

C. "Oat Grain Derivative Product" and "Oatmeal"

Claim 6 simply requires "an oat grain derivative product as an emulsifying agent." (Ex. A, '062 patent at 10:1-6.) The plain meaning of oat grain derivative product is any product derived from an oat grain. (Ex. F, Rhodes Dep. Tr. at 275:20-22.) This is the ordinary and customary meaning to a person of ordinary skill in the art at the time of the invention.

The plain meaning of "an" in the context of "an oat grain derivative as an emulsifying agent" means "one or more" oat grain derivative products, any one of which can have the effect of emulsifying. *See Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999) ("The asserted claims...use the open term 'comprising' in their transition phrases. We therefore hold that the plain meaning of 'an upstanding feed tube...to provide a hygienic flow path for delivering liquid from...and for admitting air...into said container' is not necessarily limited to a single feed tube with a single flow path for both liquid and air."); *Tate Access Floors, Inc. v. Interface Architectural Resources, Inc.*, 279 F.3d 1357, 1370 (Fed. Cir. 2002) ("It is well settled that the term 'a' or 'an' ordinarily means 'one or more.'"). Because the claim neither quantifies nor qualifies the emulsifying effect that the oat grain derivative product need have, any amount or type of emulsifying meets the plain meaning of this claim element.

Claim 9 requires "forty-five percent (45%) or less by volume of oatmeal." (Ex. A, '062 patent, at 10:13-17.) The plain meaning of the 45% or less range in claim 9 reaches to the endpoints of the range recited in the claim (i.e., more than zero percent but not greater than forty-

five percent). *See Talbert*, 275 F.3d at 1375. Claim 9, unlike claim 6, does not associate any particular function with the oat limitation.

The ordinary and customary meaning of oatmeal to a person of ordinary skill in the art is processed oat kernel. Douglas H. Greenspan, an inventor of the '062 patent, testified that he understood in 1989 that, "oatmeal" as used in the '062 patent meant ground or processed oat grain product. (Ex. C, Greenspan Dep. Tr. at 98: 4-5.) His testimony confirms the description of oatmeal in the '062 patent as processed boiled rolled oats (Ex. A., '062 patent at 4:55-60.) and is also consistent with the testimony of BBW's 30(b)(6) designee, a person of ordinary skill in the art. Dr. Lahanas testified that oatmeal is **REDACTED** (Ex. D, Lahanas Dep. Tr. at 361:21-22.) Dr. Rhodes also testified that oatmeal is processed oats, with the added refinement that oatmeal is a product derived from oat kernel. (Ex. F, Rhodes Dep. Tr. at 276:3-4.)

As discussed above, the claim terms "oat grain derivative product," "oatmeal," and "45% or less by volume" should be construed in accordance with the plain meaning of those terms. The term "oat grain derivative product" in claim 6 should be construed as a product derived from an oat grain that has any emulsifying effect anywhere in the composition in accordance with its ordinary and customary meaning to a person of ordinary skill in the art. The term "oatmeal" in claim 9 should be construed as any processed oat kernel (including extracts and powders and other derivatives) in accordance with its ordinary and customary meaning to a person of ordinary skill in the art. The limitation "45% or less by volume" should be construed as more than zero percent and less than forty-five percent in accordance with its ordinary and customary meaning to a person of ordinary skill in the art.

D. "An Emulsifying Agent"

The plain meaning of "an" in the context of "an emulsifying agent" means one or more ingredients in the composition which can have the effect of emulsifying. *See Tate Access*

Floors, Inc. v. Interface Architectural Resources, Inc., 279 F.3d 1357, 1370 (Fed. Cir. 2002) ("It is well settled that the term 'a' or 'an' ordinarily means 'one or more.'"); *Elkay Mfg. Co. v. Ebco Mfg. Co.*, 192 F.3d 973, 977 (Fed. Cir. 1999) ("The asserted claims...use the open term 'comprising' in their transition phrases. We therefore hold that the plain meaning of 'an upstanding feed tube...to provide a hygienic flow path for delivering liquid from...and for admitting air...into said container' is not necessarily limited to a single feed tube with a single flow path for both liquid and air.").

The ordinary and customary meaning of "emulsifying agent" to a person of ordinary skill in the art at the time of the invention is a product that can function to physically stabilize an oil and water system. (Ex. E, Rhodes Rep. at 5.) As Dr. Rhodes testified,

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(Ex. F, Rhodes Dep. Tr. at

69:14-18.) Dr. Rhodes further testified that

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(*Id.* at 69:21 – 70:3.)

Claim 6 does not require that an oat grain derivative product be the *only* emulsifying agent in the claimed composition. The claim recites "*an*" emulsifying agent, not "*the*" emulsifying agent. The '062 patent discloses multiple embodiments of the claimed invention that include oat grain derivative products and other emulsifying agents, specifically glycerin or safflower oil or both. (Ex. A, '062 patent at 4:30-49, 7:9-18, and 8:14-19.)

Nor should claim 6 be construed to require the grain derivative product act as the primary emulsifying agent. The language of claim 6 is clear on its face, and it would be improper to import limitations from the specification. As the Federal Circuit noted in *Interactive Gift*

Express, where "the claim language is clear on its face, ... consideration of the rest of the intrinsic evidence is restricted to determining if a deviation from the clear language of the claims is specified...." *Interactive Gift Express, Inc. v. CompuServe, Inc.*, 256 F.3d 1323, 1331 (Fed. Cir. 2001). No deviation from the clear language of the claim is specified with respect to "an emulsifying agent" and it would be error to add a limitation from the specification.

The limitation "an emulsifying agent" should be construed as a product that can function to stabilize an emulsion in accordance with its ordinary and customary meaning to a person of ordinary skill in the art.

E. "Pharmaceutically Acceptable Moisturizer"

Claims 6 and 9 require a pharmaceutically acceptable moisturizer that can be used on human skin. (Ex. A, '062 patent at 10:1-6, 13-17.) A pharmaceutically acceptable moisturizer is an ingredient that attracts water or prevents water loss and is safe for use on human skin. (Ex. E, Rhodes Rep. at 5.) The '062 patent discloses numerous moisturizers suitable for use in the claimed invention, including glycerin, aloe vera, jojoba oil, safflower oil, glycerin stearate, and glycerol stearate. (Ex. A, '062 patent at 8:46-48, 54, and 10:12.) The '062 patent also teaches that "other pharmaceutically acceptable moisturizers are within the scope of this invention as could be developed without undue experimentation by the ordinarily skilled chemist according to the teachings of the present invention." (*Id.* at 8:48-52.) The inventors specifically noted that "these other compositions are thus intended, unless otherwise specifically limited, to be encompassed by the general phrase 'moisturizer' both in this specification and in the appended claims." (*Id.* at 8:54-58.)

The limitation "pharmaceutically acceptable moisturizer" should be construed as an ingredient that attracts water or prevents water loss and is not harmful to human skin in accordance with its ordinary and customary meaning to a person of ordinary skill in the art.

F. "pH within a Range 4.5 to 6.0, Inclusively"

The ordinary and customary meaning of the claim term "pH" to a person of ordinary skill in the art is the negative common logarithm of hydrogen ion activity, i.e., a measure of acidity or alkalinity, with less than seven (7) being acidic, more than seven (7) being alkaline (basic), and seven (7) being neutral. (Ex. E, Rhodes Expert Report at 5, Ex. F, Rhodes Dep. Tr. at 327:3-7.)

Although the '062 patent does not specify any particular method of measuring pH, a person of ordinary skill in the art would know that the inventors used colorimetric methods (using test papers impregnated with various pH indicators that change colors generally corresponding to the pH level (i.e., litmus paper)). (Ex. E, Rhodes Expert Report at 5; Ex. F, Rhodes Dep. Tr. at 130:17-131:2) The colorimetric method does not permit precise measurements. See Ex. F, Rhodes Dep. Tr. at 130:6-16. Moreover, a person of ordinary skill in the art would know that measuring pH in an emulsion is problematic because of electrode drift. (Ex. F., Rhodes Dep. Tr. at 123:10-22.)

A person of ordinary skill in the art at the time of the invention would have known that pH measured colorimetrically has a precision of ± 0.5 pH units. (Ex. E, Rhodes Rep. at 6, Ex. F, Rhodes Dep. Tr. at 131:13-14.) This is consistent with the '062 patent's labeling of pH in Tables 1-3 as "approximate" and the fact that all the pH values in the patent, save one, are either an integer or an exact half of a pH unit. (Ex. E, Rhodes Rep. at 6; Ex. F, Rhodes Dep. Tr. at 130:17-131:2.)

Thus, a person of ordinary skill in the art at the time of the invention who was reading claim 6 in the context of the '062 patent specification would understand that the pH range limitations are expressed in approximate values because of the precision limits imposed by the colorimetric pH measuring used by the inventors. (Ex. E, Rhodes Rep. at 6; Ex. F, Rhodes Dep. Tr. at 128:10-14.) That person would further understand that these limitations implied an

imprecision of plus or minus 0.5 pH units. (Ex. E, Rhodes Rep. at 6, Ex. F, Rhodes Dep. Tr. at 131:13-14.) Because of that implied precision, a person of ordinary skill in the art at the time of the invention would understand that a pH range of 4.5 to 6.0 would encompass pH values as low as 4.0 ($4.5 - 0.5$) and as high as 6.5 ($6.5 + 0.5$) if the pH values were measured using a more precise measurement technique (e.g., potentiometric).

Accordingly, the claim limitation "pH within a range 4.5 to 6.0, inclusively" should be construed as pH between 4.5 and 6.0 if measured colorimetrically (i.e., using litmus paper) and pH between 4.0 and 6.5 if measured potentiometrically (i.e., using a pH meter).

CONCLUSION

LP Matthews requests that this Court construe the disputed elements of the claims of the '062 patent in accordance with their ordinary and customary meaning to a person of ordinary skill in the art at the time of the invention as set forth above.

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EXHIBIT A

United States Patent [19]

Greenspan et al.

[11] Patent Number: **5,063,062**[45] Date of Patent: **Nov. 5, 1991**[34] **CLEANING COMPOSITIONS WITH ORANGE OIL**

[75] Inventors: Douglas H. Greenspan, Louisville; Philip A. Low, Littleton, both of Colo.

[73] Assignees: D. Greenspan; W. Ingram, both of Louisville, Calif.

[21] Appl. No.: 413,295

[22] Filed: Sep. 27, 1989

[51] Int. Cl.³ A61F 13/00

[52] U.S. Cl. 424/443; 424/193.1;

424/401; 252/142; 514/783; 514/846

[58] Field of Search 424/443, 401; 514/783

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Primary Examiner—Thurman K. Page*Assistant Examiner*—James M. Spear*Attorney, Agent, or Firm*—Timothy J. Martin[57] **ABSTRACT**

A cleaning composition for cleaning the skin contains orange oil, a pharmaceutically acceptable moisturizer and an emulsifying agent. Preferably the orange oil accounts for between 2% and 60% by volume, and is further preferred that the composition contains 40% orange oil by volume. The moisturizer is either glycerin, aloe vera, jojoba oil, safflower oil or a combination thereof. The emulsifying agent preferably is oatmeal. The composition is constituted to have a pH of between 4.5 and 6.0, and the composition may be packaged as moistened towelflets in hermetic packets.

11 Claims, No Drawings

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CLEANING COMPOSITIONS WITH ORANGE OIL**FIELD OF THE INVENTION**

The present invention generally relates to cleaning compositions suitable for external application to human skin tissue in order to remove unwanted substances such as tar, caulking compounds, sealants, adhesives and the like. More specifically, however, the present invention is directed to a natural cleaning composition that utilizes only plant based ingredients. As such, the present invention is particularly adapted for cleaning non-water soluble products from the human skin in a safe, effective manner.

BACKGROUND OF THE INVENTION

A wide variety of cleaning compositions are known for external application to skin tissue in order to remove dirt and unwanted materials. Among these cleaning compounds are the various hard and liquid soaps which may be used for cleaning human skin, especially the hands. However, numerous substances with which the hands may be soiled do not respond to ordinary soap compositions. Examples of substances that are difficult to remove include grease, tar, oils, ink, caulking materials, adhesives, sealants, gums, cosmetics and other non-water soluble products.

While some cleaning compositions have been developed for these materials, the typical cleaners are harsh and can damage the skin, especially after prolonged use. Examples of these compounds include turpentine, acetone, toluene and other petroleum based products as well as ammonia based products. These products, though, often damage the skin and otherwise exhibit a high level of toxicity. Further, if inhaled during use, these petroleum based products may cause respiratory damage. When absorbed through the skin, the petroleum based products can cause damage to the major organs of the body and can have a less serious side effect of drying and chaffing the skin where applied. Thus, it should be appreciated that, although petroleum is a naturally occurring product, it is not toxicologically healthy for the human body. Accordingly, there have been substantial efforts which have been made to find suitable alternative substances for skin cleaning. While some synthetically derived substances have been developed, many of these substances are medically suspect, and in some instances produce side effects making them unsuitable for use on a regular basis.

Orange oil, as a natural product derived from the rind of oranges, has been recognized in the past to have some cleaning capabilities. Prior to the present invention, however, it is not believed that the suitability of orange oil in cleaning human skin was realized. Orange oil by itself is a skin irritant that can cause inflammation of the tissues. When used by itself, fumes from orange oil may cause headaches, dizziness and other side effects. Accordingly, it has not been readily apparent that orange oil alone or in combination with other substances could prove effective in cleaning compounds otherwise difficult to remove from the tissues of the skin. Rather, efforts in the past have been directed to the combination of orange oil with other cleaning solvents to produce floor cleaners, glass cleaners and the like.

From the foregoing, it should be appreciated that the thrust of prior development of skin cleaners, other than soap, have been directed to petroleum based products and ammonia based products and the industry has ig-

nored the potential for orange oil as a constituent of skin cleaning compounds. Despite the long felt need for better cleaners, the suitability of orange oil has thus not been recognized, and the inventors of the subject invention have found success by expanding this substance contrary to the direction of inquiry adopted by the industry at large.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a new and useful compound for cleaning the human skin.

Another object of the present invention is to provide a skin cleaning compound suitable for cleaning non-water soluble products such as grease, caulking, adhesives, sealants, tar, oils, ink and the like.

Yet another object of the present invention is to provide a skin cleaning composition which is non-toxic.

It is a further object of the present invention is to provide a skin cleaning composition that is derived from natural vegetable and plant sources.

Still a further object of the present invention is to provide a skin cleaning composition that not only removes unwanted substances from the human skin but also acts to help clean and revitalize the human skin.

The present invention, then, provides a skin cleaning composition which is adapted for external use on human tissues. Broadly, this composition comprises a first ingredient being between five percent (5%) and sixty percent (60%) by volume of orange oil, a second ingredient being a pharmaceutically acceptable moisturizer for human skin and a third ingredient being an emulsifying agent. Preferably, the moisturizer is selected from a group consisting of: glycerin, aloe vera, jojoba oil, and safflower oil. Further, it is preferred that the emulsifying agent also function as an emollient. Preferably the emulsifying agent is a natural grain derivative, preferably either oat gum or oatmeal. Further, it is preferred that the first, second, and third ingredients are selected and mixed in a ratio such that the resulting skin cleaning composition has a pH range of between 4.5 and 6.0 inclusively. To this end, a fourth ingredient in the form of a buffering compound may be added to the composition.

In the more specific composition according to the preferred embodiment, the cleaning composition comprises forty-five percent (45%) or less by volume of orange oil, forty-five percent (45%) or less by volume of the emulsifying agent and the pharmaceutically acceptable moisturizer. The preferred emulsifying agent in this composition is oatmeal, and the preferred moisturizer is a mixture of jojoba oil, aloe vera and glycerin mixed by volume of approximately two parts jojoba oil, two parts aloe vera and one part glycerin. It is further desired to use a small portion of safflower oil both as a moisturizer and to help form a stable emulsion.

These and other objects of the present invention will become more readily appreciated and understood from a consideration of the following detailed description of the preferred embodiment:

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is directed to a cleaning composition utilized on skin tissues and having, as its cleaning ingredient, the commercially available substance known as orange oil derived from the rinds of oranges. In this broad form, the composition includes orange oil,

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an emulsifying agent and a pharmaceutically acceptable moisturizer. In order to determine the preferred composition of the present invention, a series of samples having differing properties were evaluated to establish a desired range in pH and to establish the necessary proportion of orange oil to give suitable cleaning. These test samples are set forth below.

In their investigation of cleaning compositions according to the present invention, Applicants first investigated several compositions which were mixtures of orange oil, water, moisturizers and vitamin E. These samples were developed to test the cleaning properties of orange oil and to evaluate orange oil mixed with moisturizing agents. A test group of ten persons, male and female, were selected to subjectively evaluate the results of these samples. Initially, three such samples were prepared, and the compositions are set forth as Samples I-III, as follows:

SAMPLE I

Ingredient	Volume Percent (Approximate)
Orange Oil	20
Water	33
Glycerin*	12
Aloe Vera*	12
Jojoba Oil*	3
Vitamin E	1

*Total Moisturizers accounted for approximately 27% by volume

SAMPLE II

Ingredient	Volume Percent (Approximate)
Orange Oil	34.5
Water	27.5
Glycerin*	17
Aloe Vera*	14
Jojoba Oil*	1.5
Vitamin E	3.5

*Total Moisturizers accounted for approximately 34.5% by volume

SAMPLE III

Ingredient	Volume Percent (Approximate)
Orange Oil	37
Water	26
Glycerin*	14.75
Aloe Vera*	14.75
Jojoba Oil*	3.3
Vitamin E	4

*Total Moisturizers accounted for approximately 32% by volume

Prior to presenting these samples to the test group, Applicants tested the relative acidity of the samples since it was believed desirable to avoid a composition that was either too acidic or too basic. The result of this acidity measurement, correlated to the Samples, is set forth in Table I below:

TABLE I

Sample	pH (Approximate)
I	4.3
II	5
III	4.7

In each of the cases of Samples I-III, the respective components were mixed and blended in an attempt to form an emulsion. An initial problem was noted with each of these Samples, however, in that the emulsion separated, that is, "broke" after approximately one to

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two days. Since it was fairly simple to re-blend the Samples, Samples I-III were submitted to the test group for evaluation. Generally, the results of the composition was excellent with each of Samples I-III readily removing polyurethane and silicone base caulking compounds, dirt, grease, oil and adhesives; each of these industrial type substances are regarded as difficult to remove from the human hands. All ten members of the test group reported comparable cleaning properties and reported that their hands were left soft after a two week period of using the compounds. Indeed, after two weeks of use, certain male members of the test group who had dry hands resulting from the use of other solvents noted substantial improvement in the texture and softness of their hands. No allergic reactions were reported by any members of the test group.

After determining that test Samples I-III performed adequately in cleaning the hands and in moisturizing the hands, it became necessary to determine whether the oil orange and moisturizer emulsion could be stabilized so that it would not break over a period of time. In order to determine if a natural ingredient could act as an emulsifying agent, the Applicants selected a grain base derivative as an emulsifying agent. To this end, Applicants tested oatmeal gum and oatmeal to act as the primary emulsifier. Accordingly, two more test samples, Samples IV and V were prepared according to the compositions set forth below:

SAMPLE IV

Ingredient	Volume Percent (Approximate)
Orange Oil	42.75
Aloe Vera*	7
Jojoba Oil*	1.5
Safflower Oil*	4
Oatmeal Gum	42.75

*Total Moisturizers accounted for approximately 14.5% by volume

SAMPLE V

Ingredient	Volume Percent (Approximate)
Orange Oil	36.5
Aloe Vera	14
Jojoba Oil*	14
Glycerin*	7
Safflower Oil*	0.5
Oatmeal	28

*Total Moisturizers accounted for approximately 35.5% by volume

It may be noted that, in Samples IV and V, vitamin E and water were both omitted from the composition. However, it should be noted that both the oatmeal gum in Sample IV and the oatmeal in Sample V each contain a portion of water. In Sample IV, the oatmeal gum was prepared by boiling rolled oats in water and straining the resultant mass to remove the hulls. In Sample V, rolled oats were boiled in water and the resulting mass (containing approximately 50% water) was used to prepare the composition. Relatively equal parts of orange oil and oat derivatives were used and a small portion of safflower oil was included. Again, relative acidity was tested and it was found that Sample IV had a pH of approximately 5.0 while Sample V had a pH of 5.5.

Samples IV and V were submitted to the test group to evaluate cleaning effectiveness and moisturizing ability. Further, observation of the two compositions were

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made to determine whether or not the emulsions broke. The results of this study determined that the emulsion of Sample IV broke after approximately seven days while the emulsion according to Sample V did not separate over any observed duration of time (several months). The test group observed that the cleaning properties of Samples IV and V were almost, but not quite, as effective as the cleaning properties of Samples I-III, but that the cleaning effectiveness was estimated at approximately 90% of Samples I-III. With respect to Sample IV, the test group reported that their hands did not roughen, but that the sample did not feel as comfortable when on the hands. With respect to Sample V, the test group reported that the emulsion both felt comfortable on the hands and left their hands soft after approximately five days of regular usage. In each case, the emulsions were able to clean all caulking materials and tars, including silicone and polyurethane based caulking compounds as well as oil and grease from the skin. Further tests were conducted on compositions similar to Sample V were in the amount of orange oil was slightly increased while holding the amounts of the remaining ingredients constant until the emulsion broke. It was found that, with these compositions, the emulsion broke when orange oil accounted for approximately 38% by volume of the composition.

From the foregoing, Applicants determined that Sample V offered the best compromise among emulsion stability, cleaning effectiveness, and skin effect. Therefore, utilizing Sample V as a reference, Applicants adjusted the amount of orange oil (ignoring whether the emulsion broke) to determine an effective pH range wherein the composition felt comfortable on the human hands. A first set of samples set forth below as Samples VI-IX were prepared to be less acidic than Sample V, and a second set of test samples, set forth below as Samples X-XIII were tested for compositions having greater acidity than Sample V. Samples VI-IX were prepared by simply buffering Sample V with differing amounts of sodium bicarbonate. The resulting samples were buffered to have pH values according to Table 2 as follows:

TABLE 2

Sample	pH (Approximate)
VI	8.0
VII	8.0
VIII	7.0
IX	6.0

Each of Samples VI-IX were evaluated by the test group. Samples VI and VII were reported to immediately make the hands dry upon first application of the respective composition and removal of the composition with water. With respect to Samples VIII and IX, the test group reported less drying than Samples VI and VII although more dryness of the hands was noted in comparison to test Sample V. These empirical observations lead Applicants to conclude that an acidity of at least pH 6.0 is desirable, that is, that the preferred composition should not be more basic than pH 6.0.

To evaluate test compositions for excess acidity, Applicants merely increased the amount of orange oil in test Sample V while holding the amounts of the remaining ingredients constant to obtain desired acidity levels according to Table 3, below:

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TABLE 3

Sample	pH (Approximate)
X	2.5
XI	3.0
XII	3.5
XIII	4.0

Test Sample X had a volume percent of approximately 80% orange oil, Sample IX had orange oil of approximately 70% by volume, Sample XII had orange oil of approximately 60% by volume, and Sample XIII had orange oil of approximately 50% by volume.

It had previously been found that orange oil alone exhibited excellent cleaning properties, but left the hands feeling too dry and too astringent. With respect to Samples X-XIII, in each case no emulsion formed. The test group reported that each of Samples X-XIII had excellent cleaning properties, but the emulsions felt too astringent on the hands even after limited use. Applicants accordingly concluded that it was desirable that the emulsified composition have a pH that is approximately 4.5. Thus, Applicants further concluded that the composition according to the preferred embodiment of the present invention should have a pH of between 4.5 and 6.0, inclusively.

As noted in the above examples, the emulsions according to Sample V broke at approximately 38% orange oil by volume. In order to evaluate cleaning properties as a function of percent volume of orange oil, additional samples were prepared wherein the weight percentages of the ingredients other than orange oil was held constant while the amount of orange oil was varied to provide differing volume percentages of orange oil. Accordingly, Samples XIV-XVII were prepared to have volume percents of orange oil approximately 5%, 10%, 15% and 25%, respectively. In each case, the emulsions were stable. These Samples XIV-XVII were given to the test group to subjectively evaluate cleaning effectiveness. With respect to Sample XIV, the test group reported that cleaning properties were substantially reduced; Sample XIV could not effectively clean tar or caulking compounds. Indeed, Sample XIV was only effective in removing cosmetics from the skin. Sample XV eventually was able to remove silicone caulking compounds but was unable to remove polyurethane caulking or tar. With respect to Sample XVI, the test group reported about 50%-60% of the cleaning effectiveness of Sample V with no marked increase in benefits in skin softening. Sample XVII was reported to have approximately 80% of the cleaning effectiveness of Sample V in removing all of the tested materials, but again there was no report of skin enhancements over Sample V.

From these tests, Applicants concluded that, with respect to cosmetics, a composition according to the present invention could have as little as 5% by volume of orange oil although it was preferable to have a cleaning composition having at least 25% by volume of orange oil.

To determine whether the moisturizers had any effect on the composition or whether pH was the dominant skin effecting property, Applicants prepared yet another sample, Sample XVIII, wherein 100% orange oil was buffered with sodium bicarbonate so that it had a pH of 5.5. This Sample XVIII was tested and it was determined that it was exceptionally drying and astringent.

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gent on the human hands. Indeed, Sample XVIII proved almost as drying and astringent as Sample X.

In order to increase the amount of orange oil, Applicants further tested a variation on Sample V wherein both the amount of orange oil and the amount of oatmeal were increased while the amount of moisturizers was decreased. This Sample XIX, was prepared as follows:

SAMPLE XIX	
Ingredient	Volume Percent (Approximate)
Orange Oil	40.3
Aloe Vera*	7.75
Jajoba Oil*	7.75
Glycerin*	4.3
Safflower Oil*	3
Oatmeal	29

*Total Moisturizer accounted for 20.5% by volume

From Sample XIX, it was concluded that orange oil could be increased, along with a corresponding increase in an oat grain derivative, until approximately 45% by volume of orange oil was included in the composition. Any amount of orange oil in excess of this amount would result in the diminishment of moisturizers so as to negate the softening effect of the hand cleaning composition according to the preferred invention.

Other samples, set forth below as Samples XX-XXIII were prepared utilizing other materials. These samples are as follows:

SAMPLE XX	
Ingredient	Volume Percent (Approximate)
Orange Oil	30
Olive Oil	25
Jajoba Oil	25
Baking Soda	Trace

SAMPLE XXI	
Ingredient	Volume Percent (Approximate)
Orange Oil	30
Glycerin	30

SAMPLE XXII	
Ingredient	Volume Percent (Approximate)
Orange Oil	30
Aloe Vera	30

SAMPLE XXIII	
Ingredient	Volume Percent (Approximate)
Orange Oil	12.5
Vitamin E	87.5

Sample XX was found to have a pH of approximately 8.5. While Sample XX was deemed effective in cleaning, there was some reduction of cleaning effectiveness over Sample V and the composition left a dryness when wiped off of the skin. Further, the emulsion broke almost immediately. With respect to Samples XXI and XXII, both samples left a sticky residue on the hands but were approximately equal in cleaning effectiveness to Sample V. Sample XXI had a pH a little greater than 2.0 while Sample XXII had a pH of approximately 3.5.

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It was thus observed that aloe vera had some buffering effect on the acidity of the orange oil. Each of Samples XXI and XXII were highly astringent and left the test groups hands dry after washing with water. With respect to Sample XXIII, again this sample proved effective in removing cosmetics, but the sample was not effect in removing heavier, industrial substances such as caulking compounds, adhesives, tars and the like. The orange oil and Vitamin E, however, did mix without separation and a resulting acidity of pH 3.0.

From the information derived from all of the aforementioned samples, Applicants determined that glycerin and safflower oil are both desirable in the preferred compositions. On one hand glycerin appears both to stabilize the emulsion and perform as a moisturizer while, on the other hand, safflower oil appears to act as an emulsion stabilizer, as an emulsifying agent and as a moisturizer.

According to the above, Applicants prefer the compositions set forth in Sample V and Sample XIX for use in cleansing unwanted materials from human skin. In order to test administration of the preferred composition, Applicants applied the compound directly to the skin as a liquid emulsion and removed the emulsion from the hands by washing with water. In addition, Applicants were successful in soaking toweltels, formed of standard absorbent material such as paper, cloth and the like, in the liquid emulsion so that a toweltel would become impregnated with the cleaning composition. These toweltels can be hermetically sealed in standard foil packages, as known in the industry, so that the user can simply remove from the skin any of the described unwanted materials with a pre-moistened toweltel. This is particularly useful in situations where water is not readily available. Further, individualized packets of pre-moistened toweltels are convenient for portability and on-the-job use.

From the foregoing, the inventors have concluded that a suitable skin cleaning composition can be prepared wherein the skin composition has a first ingredient of between 5% and 60% by volume of orange oil, a second ingredient being a pharmaceutically acceptable moisturizer for human skin and a third ingredient being an emulsifying agent. Preferably, the moisturizer is either one or more of a group of moisturizers selected from the following: glycerin, aloe vera, jajoba oil, safflower oil. However, other pharmaceutically acceptable moisturizers are within the scope of this invention as could be developed without undue experimentation by the ordinarily skilled chemist according to the teachings of the present invention. One example of such a moisturizer is glycerin stearate. These other compositions are thus intended, unless otherwise specifically limited, to be encompassed by the general phrase "moisturizer" both in this specification and in the appended claims. In any event, it is preferred that the resultant composition have a pH between 4.5 to 6.0 and can be so buffered if necessary by the utilization of aloe vera or a buffering agent, such as baking soda.

Accordingly, the present invention has been described with some degree of particularity directed to the preferred embodiment of the present invention. It should be appreciated, though, that the present invention is defined by the following claims construed in light of the prior art so that modifications or changes may be made to the preferred embodiment of the present inven-

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tion without departing from the inventive concepts contained herein.

We claim:

1. A skin cleaning composition adapted for external use on human tissues, comprising a first ingredient being between five percent (5%) and sixty percent (60%) by volume of orange oil, a second ingredient being a pharmaceutically acceptable moisturizer for human skin and a third ingredient being an emulsifying agent in the form of an oat grain derivative product.

2. A skin cleaning composition according to claim 1 wherein said moisturizer is selected from a group consisting of: glycerin, aloe vera, jojoba oil, and safflower oil.

3. A skin cleaning composition according to claim 1 wherein said oat grain derivative product is one of oat gum and oatmeal.

4. A skin cleaning composition according to claim 1 wherein said first, second and third ingredients are selected and mixed in a ratio such that the resulting skin cleaning composition has a pH range of between 4.5 to 6.0, inclusively.

5. A skin cleaning composition according to claim 1 including as a fourth ingredient a buffering compound in a proportion such that the resulting composition is pH balanced within a range of 4.5 to 6.0, inclusively.

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6. A skin cleaning composition for external use on human tissues, comprising orange oil, a pharmaceutically acceptable moisturizer for human skin and an oat grain derivative product as an emulsifying agent, wherein said composition has a pH within a range of 4.5 to 6.0, inclusively.

7. A skin cleaning composition according to claim 5 including a buffering compound.

8. A skin cleaning composition according to claim 5 wherein said moisturizer is selected from a group consisting of: glycerin, aloe vera, jojoba oil, safflower oil and glycerol stearate.

9. A cleaning composition for use on human skin comprising forty-five percent (45%) or less by volume of orange oil, forty-five percent (45%) or less by volume of oatmeal and a pharmaceutically acceptable moisturizer.

10. A cleaning composition according to claim 9 wherein said moisturizer is a mixture of jojoba oil, aloe vera and glycerin.

11. A cleaning composition according to claim 1 wherein said mixture includes by volume two parts jojoba oil, two parts aloe vera and one part glycerin.

12. A cleaning composition according to claim 9 wherein said mixture includes safflower oil.

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EXHIBIT B

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Update	To Date	4-5-91	8/2/90

SEARCH NOTES		
	Date	Exmr.
CRS	4-4-90	8/2/90
APS searched	4-4-90	8/2/90
None	4-5-91	8/2/90

INTERFERENCE SEARCHED			
Class	Sub.	Date	Exmr.
424	443	4-5-91	8/2/90
	401	↓	↓
514	783	↓	↓

STAPLE AREA

U.S. COMMISSIONER'S OFFICE 1500-225-201

PATENT NUMBER		ORIGINAL CLASSIFICATION	
APPLICATION SERIAL NUMBER		CLASS	SUBCLASS
07/413395		424	443
APPLICANT'S NAME PLEASE PRINT		CROSS REFERENCE(S)	
GREENSPAN et al.		CLASS	SUBCLASS
P. SERVICE, ORIGINAL PATENT NUMBER		424	195.1 401
INTERNATIONAL CLASSIFICATION INT. CL. 45		252	142
161F 13/00		514	783 846
GROUP AND UNIT		ASSISTANT EXAMINER PLEASE STAMP OR PRINT FULL NAME	
152		James M. Spear	
		PRIMARY EXAMINER PLEASE STAMP OR PRINT FULL NAME	
		Thurman K. Page	

ISSUE CLASSIFICATION SLIP

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE

Claim	Date
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United States Patent [19]

Greenspan et al.

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[45] Date of Patent: Nov. 5, 1991

[54] **CLEANING COMPOSITIONS WITH ORANGE OIL**[75] Inventors: Douglas H. Greenspan, Louisville;
Phillip A. Low, Littleton, both of
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Louisville, Calif.

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424/401; 252/142; 514/783; 514/846

[58] Field of Search 424/443, 401; 514/783

[56] **References Cited****U.S. PATENT DOCUMENTS**

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pp. 23-25.*Primary Examiner*—Thurman K. Page*Assistant Examiner*—James M. Spear*Attorney, Agent, or Firm*—Timothy J. Martin[57] **ABSTRACT**

A cleaning composition for cleaning the skin contains orange oil, a pharmaceutically acceptable moisturizer and an emulsifying agent. Preferably the orange oil accounts for between 5% and 60% by volume, and it further preferred that the composition contains 40% orange oil by volume. The moisturizer is either glycerin, aloe vera, jojoba oil, safflower oil or a combination thereof. The emulsifying agent preferably is oatmeal. The composition is constituted to have a pH of between 4.5 and 6.0, and the composition may be packaged as moistened towlellets in hermetic packets.

12 Claims, No Drawings

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CLEANING COMPOSITIONS WITH ORANGE OIL

FIELD OF THE INVENTION

The present invention generally relates to cleaning compositions suitable for external application to human skin tissue in order to remove unwanted substances such as tar, caulking compounds, sealants, adhesives and the like. More specifically, however, the present invention is directed to a natural cleaning composition that utilizes only plant based ingredients. As such, the present invention is particularly adapted for cleaning non-water soluble products from the human skin in a safe, effective manner.

BACKGROUND OF THE INVENTION

A wide variety of cleaning compositions are known for external application to skin tissue in order to remove dirt and unwanted materials. Among these cleaning compounds are the various hard and liquid soaps which may be used for cleaning human skin, especially the hands. However, numerous substances with which the hands may be soiled do not respond to ordinary soap compositions. Examples of substances that are difficult to remove include grease, tar, oils, ink, caulking materials, adhesives, sealants, gums, cosmetics and other non-water soluble products.

While some cleaning compositions have been developed for these materials, the typical cleaners are harsh and can damage the skin, especially after prolonged use. Examples of these compounds include turpentine, acetone, toluene and other petroleum based products as well as ammonia based products. These products, though, often damage the skin and otherwise exhibit a high level of toxicity. Further, if inhaled during use, these petroleum based products may cause respiratory damage. When absorbed through the skin, the petroleum based products can cause damage to the major organs of the body and can have a less serious side effect of drying and chaffing the skin where applied. Thus, it should be appreciated that, although petroleum is a naturally occurring product, it is not toxicologically healthy for the human body. Accordingly, there have been substantial efforts which have been made to find suitable alternative substances for skin cleaning. While some synthetically derived substances have been developed, many of these substances are medically suspect, and in some instances produce side effects making them unsuitable for use on a regular basis.

Orange oil, as a natural product derived from the rind of oranges, has been recognized in the past to have some cleaning capabilities. Prior to the present invention, however, it is not believed that the suitability of orange oil in cleaning human skin was realized. Orange oil by itself is a skin irritant that can cause inflammation of the tissues. When used by itself, fumes from orange oil may cause headaches, dizziness and other side effects. Accordingly, it has not been readily apparent that orange oil alone or in combination with other substances could prove effective in cleaning compounds otherwise difficult to remove from the tissues of the skin. Rather, efforts in the past have been directed to the combination of orange oil with other cleaning solvents to produce floor cleaners, glass cleaners and the like.

From the foregoing, it should be appreciated that the thrust of prior development of skin cleaners, other than soap, have been directed to petroleum based products and ammonia based products and the industry has ig-

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nored the potential for orange oil as a constituent of skin cleaning compounds. Despite the long felt need for better cleaners, the suitability of orange oil has thus not been recognized, and the inventors of the subject invention have found success by examining this substance contrary to the direction of inquiry adopted by the industry at large.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide a new and useful compound for cleaning the human skin.

Another object of the present invention is to provide a skin cleaning compound suitable for cleaning non-water soluble products such as grease, caulking, adhesives, sealants, tar, oils, ink and the like.

Yet another object of the present invention is to provide a skin cleaning composition which is non-toxic.

It is a further object of the present invention is to provide a skin cleaning composition that is derived from natural vegetable and plant sources.

Still a further object of the present invention is to provide a skin cleaning composition that not only removes unwanted substances from the human skin but also acts to help clean and revitalize the human skin.

The present invention, then, provides a skin cleaning composition which is adapted for external use on human tissues. Broadly, this composition comprises a first ingredient being between five percent (5%) and sixty percent (60%) by volume of orange oil, a second ingredient being a pharmaceutically acceptable moisturizer for human skin and a third ingredient being an emulsifying agent. Preferably, the moisturizer is selected from a group consisting of: glycerin, aloe vera, jojoba oil, and safflower oil. Further, it is preferred that the emulsifying agent also function as an emollient. Preferably the emulsifying agent is a natural grain derivative, preferably either oat gum or oatmeal. Further, it is preferred that the first, second, and third ingredients are selected and mixed in a ratio such that the resulting skin cleaning composition has a pH range of between 4.5 and 6.0 inclusively. To this end, a fourth ingredient in the form of a buffering compound may be added to the composition.

In the more specific composition according to the preferred embodiment, the cleaning composition comprises forty-five percent (45%) or less by volume of orange oil, forty-five percent (45%) or less by volume of the emulsifying agent and the pharmaceutically acceptable moisturizer. The preferred emulsifying agent in this composition is oatmeal, and the preferred moisturizer is a mixture of jojoba oil, aloe vera and glycerin mixed by volume of approximately two parts jojoba oil, two parts aloe vera and one part glycerin. It is further desired to use a small portion of safflower oil both as a moisturizer and to help form a stable emulsion.

These and other objects of the present invention will become more readily appreciated and understood from a consideration of the following detailed description of the preferred embodiment:

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The present invention is directed to a cleaning composition utilized on skin tissues and having, as its cleaning ingredient, the commercially available substance known as orange oil derived from the rinds of oranges. In this broad form, the composition includes orange oil,

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an emulsifying agent and a pharmaceutically acceptable moisturizer. In order to determine the preferred composition of the present invention, a series of samples having differing properties were evaluated to establish a desired range in pH and to establish the necessary proportion of orange oil to give suitable cleaning. These test samples are set forth below.

In their investigation of cleaning compositions according to the present invention, Applicants first investigated several compositions which were mixtures of orange oil, water, moisturizers and vitamin E. These samples were developed to test the cleaning properties of orange oil and to evaluate orange oil mixed with moisturizing agents. A test group of test persons, male and female, were selected to subjectively evaluate the results of these samples. Initially, three such samples were prepared, and the compositions are set forth as Samples I-III, as follows:

SAMPLE I

Ingredient	Volume Percent (Approximate)
Orange Oil	39
Water	33
Glycerin*	12
Aloe Vera*	12
Jajoba Oil*	3
Vitamin E	1

*Total Moisturizers accounted for approximately 17% by volume.

SAMPLE II

Ingredient	Volume Percent (Approximate)
Orange Oil	34.5
Water	27.5
Glycerin*	17
Aloe Vera*	14
Jajoba Oil*	3.5
Vitamin E	3.5

*Total Moisturizers accounted for approximately 34.5% by volume.

SAMPLE III

Ingredient	Volume Percent (Approximate)
Orange Oil	37
Water	34
Glycerin*	14.75
Aloe Vera*	14.75
Jajoba Oil*	3.5
Vitamin E	4

*Total Moisturizers accounted for approximately 17% by volume.

Prior to presenting these samples to the test group, Applicants tested the relative acidity of the samples since it was believed desirable to avoid a composition that was either too acidic or too basic. The result of this acidity measurement, correlated to the Samples, is set forth in Table I below:

TABLE I

Sample	pH (Approximate)
I	4.5
II	5
III	4.7

In each of the cases of Samples I-III, the respective components were mixed and blended in an attempt to form an emulsion. An initial problem was noted with each of these Samples, however, in that the emulsion separated, that is, "broke" after approximately one to

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two days. Since it was fairly simple to re-blend the Samples, Samples I-III were submitted to the test group for evaluation. Generally, the results of the composition was excellent with each of Samples I-III readily removing polyurethane and silicone base caulking compounds, tars, grease, oil and adhesives; each of these industrial type substances are regarded as difficult to remove, from the human hands. All ten members of the test group reported comparable cleaning properties and reported that their hands were left soft after a two week period of using the compounds. Indeed, after two weeks of use, certain male members of the test group who had dry hands resulting from the use of other solvents noted substantial improvement in the texture and softness of their hands. No allergic reactions were reported by any members of the test group.

After determining that test Samples I-III performed adequately in cleaning the hands and in moisturizing the hands, it became necessary to determine whether the oil orange and moisturizer emulsion could be stabilized so that it would not break over a period of time. In order to determine if a natural ingredient could act as an emulsifying agent, the Applicants selected a grain base derivative as an emulsifying agent. To this end, Applicants tested oatmeal gum and oatmeal to act as the primary emulsifier. Accordingly, two more test samples, Samples IV and V were prepared according to the compositions set forth below:

SAMPLE IV

Ingredient	Volume Percent (Approximate)
Orange Oil	41.75
Aloe Vera*	7
Jajoba Oil*	3.5
Safflower Oil*	4
Oatmeal Gum	42.75

*Total Moisturizers accounted for approximately 14.5% by volume.

SAMPLE V

Ingredient	Volume Percent (Approximate)
Orange Oil	36.5
Aloe Vera	14
Jajoba Oil*	14
Glycerin*	7
Safflower Oil*	0.5
Oatmeal	28

*Total Moisturizers accounted for approximately 25.5% by volume.

It may be noted that, in Samples IV and V, vitamin E and water were both omitted from the composition. However, it should be noted that both the oatmeal gum in Sample IV and the oatmeal in Sample V each contain a portion of water. In Sample IV, the oatmeal gum was prepared by boiling rolled oats in water and straining the resultant mass to remove the hulls. In Sample V, rolled oats were boiled in water and the resulting mass (containing approximately 30% water) was used to prepare the composition. Relatively equal parts of orange oil and oat derivatives were used and a small portion of safflower oil was included. Again, relative acidity was tested and it was found that Sample IV had a pH of approximately 5.0 while Sample V had a pH of 5.5.

Samples IV and V were submitted to the test group to evaluate cleaning effectiveness and moisturizing ability. Further, observation of the two compositions were

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made to determine whether or not the emulsions broke. The results of this study determined that the emulsion of Sample IV broke after approximately seven days while the emulsion according to Sample V did not separate over any observed duration of time (several months). The test group observed that the cleaning properties of Samples IV and V were almost, but not quite, as effective as the cleaning properties of Samples I-III, but that the cleaning effectiveness was estimated at approximately 90% of Samples I-III. With respect to Sample IV, the test group reported that their hands did not roughen, but that the sample did not feel as comfortable when on the hands. With respect to Sample V, the test group reported that the emulsion both felt comfortable on the hands and left their hands soft after approximately five days of regular usage. In each case, the emulsions were able to clean all caulking materials and tars, including silicone and polyurethane based caulking compounds as well as oil and grease from the skin. Further tests were conducted on compositions similar to Sample V where in the amount of orange oil was slightly increased while holding the amounts of the remaining ingredients constant until the emulsion broke. It was found that, with these compositions, the emulsion broke when orange oil accounted for approximately 38% by volume of the composition.

From the foregoing, Applicants determined that Sample V offered the best compromise among emulsion stability, cleaning effectiveness, and skin effect. Therefore, utilizing Sample V as a reference, Applicants adjusted the amount of orange oil (ignoring whether the emulsion broke) to determine an effective pH range wherein the composition felt comfortable on the human hands. A first set of samples set forth below as Samples VI-IX were prepared to be less acidic than Sample V, and a second set of test samples, set forth below as Samples X-XIII were tested for compositions having greater acidity than Sample V. Samples VI-IX were prepared by simply buffering Sample V with differing amounts of sodium bicarbonate. The resulting samples were buffered to have pH values according to Table 2 as follows:

TABLE 2

Sample	pH (Approximate)
VI	9.0
VII	8.0
VIII	7.0
IX	6.0

Each of Samples VI-IX were evaluated by the test group. Samples VI and VII were reported to immediately make the hands dry upon first application of the respective composition and removal of the composition with water. With respect to Samples VIII and IX, the test group reported less drying than Samples VI and VII although more dryness of the hands was noted in comparison to test Sample V. These empirical observations lead Applicants to conclude that an acidity of at least pH 6.0 is desirable, that is, that the preferred composition should not be more basic than pH 6.0.

To evaluate test compositions for excess acidity, Applicants merely increased the amount of orange oil in test Sample V while holding the amounts of the remaining ingredients constant to obtain desired acidity levels according to Table 3, below:

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TABLE 3

Sample	pH (Approximate)
X	2.5
XI	3.0
XII	3.5
XIII	4.0

Test Sample X had a volume percent of approximately 80% orange oil, Sample IX had orange oil of approximately 70% by volume, Sample XII had orange oil of approximately 60% by volume, and Sample XIII had orange oil of approximately 50% by volume.

It had previously been found that orange oil alone exhibited excellent cleaning properties, but left the hands feeling too dry and too astringent. With respect to Samples X-XIII, in each case no emulsion formed. The test group reported that each of Samples X-XIII had excellent cleaning properties, but the emulsions felt too astringent on the hands even after limited use. Applicants accordingly concluded that it was desirable that the emulsified composition have a pH that is approximately 4.5. Thus, Applicants further concluded that the composition according to the preferred embodiment of the present invention should have a pH of between 4.5 and 6.0, inclusively.

As noted in the above examples, the emulsions according to Sample V broke at approximately 38% orange oil by volume. In order to evaluate cleaning properties as a function of percent volume of orange oil, additional samples were prepared wherein the weight percentages of the ingredients other than orange oil was held constant while the amount of orange oil was varied to provide differing volume percentages of orange oil. Accordingly, Samples XIV-XVII were prepared to have volume percents of orange oil approximately 5%, 10%, 15% and 25%, respectively. In each case, the emulsions were stable. These Samples XIV-XVII were given to the test group to subjectively evaluate cleaning effectiveness. With respect to Sample XIV, the test group reported that cleaning properties were substantially reduced; Sample XIV could not effectively clean tar or caulking compounds. Indeed, Sample XIV was only effective in removing cosmetics from the skin. Sample XV eventually was able to remove silicone caulking compounds but was unable to remove polyurethane caulking or tar. With respect to Sample XVI, the test group reported about 50%-60% of the cleaning effectiveness of Sample V with no marked increase in benefits in skin softening. Sample XVII was reported to have approximately 80% of the cleaning effectiveness of Sample V in removing all of the tested materials, but again there was no report of skin enhancements over Sample V.

From these tests, Applicants concluded that, with respect to cosmetics, a composition according to the present invention could have as little as 5% by volume of orange oil although it was preferable to have a cleaning composition having at least 25% by volume of orange oil.

To determine whether the moisturizers had any effect on the composition or whether pH was the dominant skin effecting property, Applicants prepared yet another sample, Sample XVIII, wherein 100% orange oil was buffered with sodium bicarbonate so that it had a pH of 5.5. This Sample XVIII was tested and it was determined that it was exceptionally drying and astringent.

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gent on the human hands. Indeed, Sample XVIII proved almost as drying and astringent as Sample X.

In order to increase the amount of orange oil, Applicants further tested a variation on Sample V wherein both the amount of orange oil and the amount of oatmeal were increased while the amount of moisturizers was decreased. This Sample XIX, was prepared as follows:

SAMPLE XIX	
Ingredient	Volume Percent (Approximate)
Orange Oil	40.5
Aloe Vera*	7.75
Jajoba Oil*	7.75
Glycerin*	4.5
Safflower Oil*	.5
Oatmeal	.39

*Total Moisturizers accounted for 20.5% by volume.

From Sample XIX, it was concluded that orange oil could be increased, along with a corresponding increase in an oat grain derivative, until approximately 45% by volume of orange oil was included in the composition. Any amount of orange oil in excess of this amount would result in the diminishment of moisturizers so as to negate the softening effect of the hand cleaning composition according to the preferred invention.

Other samples, set forth below as Samples XX-XXIII, were prepared utilizing other materials. These samples are as follows:

SAMPLE XX	
Ingredient	Volume Percent (Approximate)
Orange Oil	50
Olive Oil	25
Jajoba Oil	25
Baking Soda	Trace

SAMPLE XXI	
Ingredient	Volume Percent (Approximate)
Orange Oil	50
Glycerin	30

SAMPLE XXII	
Ingredient	Volume Percent (Approximate)
Orange Oil	50
Aloe Vera	30

SAMPLE XXIII	
Ingredient	Volume Percent (Approximate)
Orange Oil	12.5
Vitamin E	87.5

Sample XX was found to have a pH of approximately 8.5. While Sample XX was deemed effective in cleaning, there was some reduction of cleaning effectiveness over Sample V and the composition left a dryness when wiped off of the skin. Further, the emulsion broke almost immediately. With respect to Samples XXI and XXII, both samples left a sticky residue on the hands but were approximately equal in cleaning effectiveness to Sample V. Sample XXI had a pH a little greater than 2.0 while Sample XXII had a pH of approximately 3.5.

It was thus observed that aloe vera had some buffering effect on the acidity of the orange oil. Each of Samples XXI and XXII were highly astringent and left the test groups hands dry after washing with water. With respect to Sample XXIII, again this sample proved effective in removing cosmetics, but the sample was not effect in removing heavier, industrial substances such as caulking compounds, adhesives, tars and the like. The orange oil and Vitamin E, however, did mix without separation and a resulting acidity of pH 5.0.

From the information derived from all of the aforementioned samples, Applicants determined that glycerin and safflower oil are both desirable in the preferred compositions. On one hand glycerin appears both to stabilize the emulsion and perform as a moisturizer while, on the other hand, safflower oil appears to act as an emulsion stabilizer, as an emulsifying agent and as a moisturizer.

According to the above, Applicants prefer the compositions set forth in Sample V and Sample XIX for use in cleaning unwanted materials from human skin. In order to test administration of the preferred composition, Applicants applied the compound directly to the skin as a liquid emulsion and removed the emulsion from the hands by washing with water. In addition, Applicants were successful in soaking towellets, formed of standard absorbent material such as paper, cloth and the like, in the liquid emulsion so that a towellet would become impregnated with the cleaning composition. These towellets can be hermetically sealed in standard foil packages, as known in the industry, so that the user can simply remove from the skin any of the described unwanted materials with a pre-moistened towellet. This is particularly useful in situations where water is not readily available. Further, individualized packets of pre-moistened towellets are convenient for portability and on-the-job use.

From the foregoing, the inventors have concluded that a suitable skin cleaning composition can be prepared wherein the skin composition has a first ingredient of between 5% and 60% by volume of orange oil, a second ingredient being a pharmaceutical acceptable moisturizer for human skin and a third ingredient being an emulsifying agent. Preferably, the moisturizer is either one or more of a group of moisturizers selected from the following: glycerin, aloe vera, jojoba oil, safflower oil. However, other pharmaceutically acceptable moisturizers are within the scope of this invention as could be developed without undue experimentation by the ordinarily skilled chemist according to the teachings of the present invention. One example of such a moisturizer is glycerin searate. These other compositions are thus intended, unless otherwise specifically limited, to be encompassed by the general phrase "moisturizer" both in this specification and in the appended claims. In any event, it is preferred that the resultant composition have a pH between 4.5 to 6.0 and can be so buffered if necessary by the utilization of aloe vera or a buffering agent, such as baking soda.

Accordingly, the present invention has been described with some degree of particularity directed to the preferred embodiment of the present invention. It should be appreciated, though, that the present invention is defined by the following claims construed in light of the prior art so that modifications or changes may be made to the preferred embodiment of the present inven-

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tion without departing from the inventive concepts contained herein.

We claim:

1. A skin cleaning composition adapted for external use on human tissues, comprising a first ingredient being between five percent (5%) and sixty percent (60%) by volume of orange oil, a second ingredient being a pharmaceutically acceptable moisturizer for human skin and a third ingredient being an emulsifying agent in the form of an oat grain derivative product.

2. A skin cleaning composition according to claim 1 wherein said moisturizer is selected from a group consisting of: glycerin, aloe vera, jojoba oil, and safflower oil.

3. A skin cleaning composition according to claim 1 wherein said oat grain derivative product is one of oat gum and oatmeal.

4. A skin cleaning composition according to claim 1 wherein said first, second and third ingredients are selected and mixed in a ratio such that the resulting skin cleaning composition has a pH range of between 4.5 to 6.0, inclusively.

5. A skin cleaning composition according to claim 1 including as a fourth ingredient a buffering compound in a proportion such that the resulting composition is pH balanced within a range of 4.5 to 6.0, inclusively.

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6. A skin cleaning composition for external use on human tissues, comprising orange oil, a pharmaceutically acceptable moisturizer for human skin and an oat grain derivative product as an emulsifying agent, wherein said composition has a pH within a range of 4.5 to 6.0, inclusively.

7. A skin cleaning composition according to claim 5 including a buffering compound.

8. A skin cleaning composition according to claim 5 wherein said moisturizer is selected from a group consisting of: glycerin, aloe vera, jojoba oil, safflower oil and glycerol stearate.

9. A cleaning composition for use on human skin comprising forty-five percent (45%) or less by volume of orange oil, forty-five percent (45%) or less by volume of oatmeal and a pharmaceutically acceptable moisturizer.

10. A cleaning composition according to claim 8 wherein said moisturizer is a mixture of jojoba oil, aloe vera and glycerin.

11. A cleaning composition according to claim 1 wherein said mixture includes by volume two parts jojoba oil, two parts aloe vera and one part glycerin.

12. A cleaning composition according to claim 9 wherein said mixture includes safflower oil.

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PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

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ABSTRACT

A cleaning composition for cleaning the skin contains orange oil, a pharmaceutically acceptable moisturizer and an emulsifying agent. Preferably the orange oil accounts for between 3% and 60% by volume, and it further preferred that the composition contains 40% orange oil by volume. The moisturizer is either glycerin, aloe vera, jojoba oil, safflower oil or a combination thereof. The emulsifying agent preferably is oatmeal. The composition is constituted to have a pH of between 4.5 and 6.0, and the composition may be packaged as moistened towellets in hermetic packets.

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CLEANING COMPOSITIONS WITH ORANGE OIL

FIELD OF THE INVENTION

5 The present invention generally relates to cleaning compositions suitable for external application to human skin tissue in order to remove unwanted substances such as tar, caulking compounds, sealants, adhesives and the like. More specifically, however, the present invention is directed to a natural cleaning composition that utilizes only plant based ingredients. As such, the present invention is particularly adapted for cleaning non-water soluble products from the human skin in a safe, effective manner.

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BACKGROUND OF THE INVENTION

15 A wide variety of cleaning compositions are known for external application to skin tissue in order to remove dirt and unwanted materials. Among these cleaning compounds are the various hard and liquid soaps which may be used for cleaning human skin, especially the hands. However, numerous substances with which the hands may be soiled do not respond to ordinary soap compositions. Examples of substances that are difficult to remove include grease, tar, oils, ink, caulking materials, adhesives, sealants, gums, cosmetics and other non-water soluble products.

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While some cleaning compositions have been developed for these materials, the typical cleaners are

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harsh and can damage the skin, especially after prolonged use. Examples of these compounds include turpentine, acetone, toluene and other petroleum based products as well as ammonia based products. These products, though, often damage the skin and otherwise exhibit a high level of toxicity. Further, if inhaled during use, these petroleum based products may cause respiratory damage. When absorbed through the skin, the petroleum based products can cause damage to the major organs of the body and can have a less serious side effect of drying and chaffing the skin where applied. Thus, it should be appreciated that, although petroleum is a naturally occurring product, it is not toxilogically healthy for the human body. Accordingly, there have been substantial efforts which have been made to find suitable alternative substances for skin cleaning. While some synthetically derived substances have been developed, many of these substances are medically suspect, and in some instances produce side effects making them unsuitable for use on a regular basis.

Orange oil, as a natural product derived from the rind of oranges, has been recognized in the past to have some cleaning capabilities. Prior to the present invention, however, it is not believed that the suitability of orange oil in cleaning human skin was realized. Orange oil by itself is a skin irritant that can cause inflammation of the tissues. When used by

itself, fumes from orange oil may cause headaches, dizziness and other side effects. Accordingly, it has not been readily apparent that orange oil alone or in combination with other substances could prove effective in cleaning compounds otherwise difficult to remove from the tissues of the skin. Rather, efforts in the past have been directed to the combination of orange oil with other cleaning solvents to produce floor cleaners, glass cleaners and the like.

From the foregoing, it should be appreciated that the thrust of prior development of skin cleaners, other than soap, have been directed to petroleum based products and ammonia based products and the industry has ignored the potential for orange oil as a constituent of skin cleaning compounds. Despite the long felt need for better cleaners, the suitability of orange oil has thus not been recognized, and the inventors of the subject invention have found success by examining this substance contrary to the direction of inquiry adopted by the industry at large.

C SUMMARY OF THE INVENTION

P It is an object of the present invention to provide a new and useful compound for cleaning the human skin.

Another object of the present invention is to provide a skin cleaning compound suitable for cleaning non-water soluble products such as grease, caulking,

adhesives, sealants, tar, oils, ink and the like.

Yet another object of the present invention is to provide a skin cleaning composition which is non-toxic.

It is a further object of the present invention is
5 to provide a skin cleaning composition that is derived from natural vegetable and plant sources.

Still a further object of the present invention is to provide a skin cleaning composition that not only removes unwanted substances from the human skin but also
10 acts to help clean and revitalize the human skin.

The present invention, then, provides a skin cleaning composition which is adapted for external use on human tissues. Broadly, this composition comprises a first ingredient being between five percent (5%) and
15 sixty percent (60%) by volume of orange oil, a second ingredient being a pharmaceutically acceptable moisturizer for human skin and a third ingredient being an emulsifying agent. Preferably, the moisturizer is selected from a group consisting of: glycerin, aloe
20 vera, jojoba oil, and safflower oil. Further, it is preferred that the emulsifying agent also function as an emollient. Preferably the emulsifying agent is a natural grain derivative, preferably either oat gum or oatmeal. Further, it is preferred that the first,
25 second, and third ingredients are selected and mixed in a ratio such that the resulting skin cleaning composition has a pH range of between 4.5 and 6.0 inclusively. To this end, a fourth ingredient in the

form of a buffering compound may be added to the composition.

In the more specific composition according to the preferred embodiment, the cleaning composition comprises
5 forty-five percent (45%) or less by volume of orange oil, forty-five percent (45%) or less by volume of the emulsifying agent and the pharmaceutically acceptable moisturizer. The preferred emulsifying agent in this composition is oatmeal, and the preferred moisturizer is
10 a mixture of jojoba oil, aloe vera and glycerin mixed by volume of approximately two parts jojoba oil, two parts aloe vera and one part glycerin. It is further desired to use a small portion of safflower oil both as a moisturizer and to help form a stable emulsion.

15 These and other objects of the present invention will become more readily appreciated and understood from a consideration of the following detailed description of the preferred embodiment:

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

20 The present invention is directed to a cleaning composition utilized on skin tissues and having, as its cleaning ingredient, the commercially available substance known as orange oil derived from the rinds of oranges. In this broad form, the composition includes orange oil, an emulsifying agent and a pharmaceutically
25 acceptable moisturizer. In order to determine the preferred composition of the present invention, a series

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of samples having differing properties were evaluated to establish a desired range in pH and to establish the necessary proportion of orange oil to give suitable cleaning. These test samples are set forth below.

5 In their investigation of cleaning compositions according to the present invention, Applicants first investigated several compositions which were mixtures of orange oil, water, moisturizers and vitamin E. These samples were developed to test the cleaning properties
10 of orange oil and to evaluate orange oil mixed with moisturizing agents. A test group of ten persons, male and female, were selected to subjectively evaluate the results of these samples. Initially, three such samples were prepared, and the compositions are set forth as
15 Samples I-III, as follows:

SAMPLE I

Ingredient	Volume Percent (Approximate)
Orange Oil	39
Water	33
Glycerin*	12
Aloe Vera*	12
20 Jojoba Oil*	3
Vitamin E	1

* Total Moisturizers accounted for approximately 27% by volume.

SAMPLE II

<u>Ingredient</u>	<u>Volume Percent</u> <u>(Approximate)</u>
Orange Oil	34.5
Water	27.5
Glycerin*	17
Aloe Vera*	14
Jobba Oil*	3.5
Vitamin E	2.5

* Total Moisturizers accounted for approximately 34.5% by volume.

SAMPLE III

<u>Ingredient</u>	<u>Volume Percent</u> <u>(Approximate)</u>
Orange Oil	37
Water	26
Glycerin*	14.75
Aloe Vera*	14.75
Jobba Oil*	3.5
Vitamin E	4

* Total Moisturizers accounted for approximately 33% by volume.

Prior to presenting these samples to the test group, Applicants tested the relative acidity of the samples since it was believed desirable to avoid a composition that was either too acidic or too basic.

The result of this acidity measurement, correlated to the Samples, is set forth in Table 1 below:

TABLE 1

Sample	pH (Approximate)
I	4.5
II	5
III	4.7

In each of the cases of Samples I-III, the respective components were mixed and blended in an attempt to form an emulsion. An initial problem was noted with each of these Samples, however, in that the emulsion separated, that is, "broke" after approximately one to two days. Since it was fairly simple to re-blend the Samples, Samples I-III were submitted to the test group for evaluation. Generally, the results of the composition was excellent with each of Samples I-III readily removing polyurethane and silicone base caulking compounds, tars, grease, oil and adhesives; each of these industrial type substances are regarded as difficult to remove, from the human hands. All ten members of the test group reported comparable cleaning properties and reported that their hands were left soft after a two week period of using the compounds. Indeed, after two weeks of use, certain male members of the test group who had dry hands resulting from the use of other solvents noted substantial improvement in the texture

and softness of their hands. No allergic reactions were reported by any members of the test group.

After determining that test Samples I-III performed adequately in cleaning the hands and in moisturizing the hands, it became necessary to determine whether the oil orange and moisturizer emulsion could be stabilized so that it would not break over a period of time. In order to determine if a natural ingredient could act as an emulsifying agent, the Applicants selected a grain base derivative as an emulsifying agent. To this end, Applicants tested oatmeal gum and oatmeal to act as the primary emulsifier. Accordingly, two more test samples, Samples IV and V were prepared according to the compositions set forth below:

SAMPLE IV

	Ingredient	Volume Percent (Approximate)
15	Orange Oil	42.75
	Aloe Vera*	7
	Jojoba Oil*	3.5
	Safflower Oil*	4
	Oatmeal Gum	42.75
20	* Total Moisturizers accounted for approximately 14.5% by volume.	

SAMPLE V

Ingredient	Volume Percent (Approximate)
Orange Oil	36.5
Aloe Vera	14
Joloba Oil*	14
Glycerin*	7
Safflower Oil*	0.5
Oatmeal	28

* Total Moisturizers accounted for approximately 95.5% by volume.

It may be noted that, in Samples IV and V, vitamin E and water were both omitted from the composition. However, it should be noted that both the oatmeal gum in Sample IV and the oatmeal in Sample V each contain a portion of water. In Sample IV, the oatmeal gum was prepared by boiling rolled oats in water and straining the resultant mass to remove the hulls. In Sample V, rolled oats were boiled in water and the resulting mass (containing approximately 50% water) was used to prepare the composition. Relatively equal parts of orange oil and oat derivatives were used and a small portion of safflower oil was included. Again, relative acidity was tested and it was found that Sample IV had a pH of approximately 5.0 while Sample V had a pH of 5.5.

Samples IV and V were submitted to the test group to evaluate cleaning effectiveness and moisturizing ability. Further, observation of the two compositions

were made to determine whether or not the emulsions broke. The results of this study determined that the emulsion of Sample IV broke after approximately seven days while the emulsion according to Sample V did not separate over any observed duration of time (several months). The test group observed that the cleaning properties of Samples IV and V were almost, but not quite, as effective as the cleaning properties of Samples I-III, but that the cleaning effectiveness was estimated at approximately 90% of Samples I-III. With respect to Sample IV, the test group reported that their hands did not roughen, but that the sample did not feel as comfortable when on the hands. With respect to Sample V, the test group reported that the emulsion both felt comfortable on the hands and left their hands soft after approximately five days of regular usage. In each case, the emulsions were able to clean all caulking materials and tars, including silicone and polyurethane based caulking compounds as well as oil and grease from the skin. Further tests were conducted on compositions similar to Sample V where the amount of orange oil was slightly increased while holding the amounts of the remaining ingredients constant until the emulsion broke. It was found that, with these compositions, the emulsion broke when orange oil accounted for approximately 38% by volume of the composition.

From the foregoing, Applicants determined that Sample V offered the best compromise among emulsion

stability, cleaning effectiveness, and skin effect.
 Therefore, utilizing Sample V as a reference, Applicants
 adjusted the amount of orange oil (ignoring whether the
 emulsion broke) to determine an effective pH range
 5 wherein the composition felt comfortable on the human
 hands. A first set of samples set forth below as
 Samples VI-IX were prepared to be less acidic than
 Sample V, and a second set of test samples, set forth
 below as Samples X-XIII were tested for compositions
 10 having greater acidity than Sample V. Samples VI-IX
 were prepared by simply buffering Sample V with
 differing amounts of sodium bicarbonate. The resulting
 samples were buffered to have pH values according to
 Table 2 as follows:

TABLE 2

	Sample	pH (Approximate)
15	VI	9.0
	VII	8.0
	VIII	7.0
	IX	6.0

Each of Samples VI-IX were evaluated by the test
 20 group. Samples VI and VII were reported to immediately
 make the hands dry upon first application of the
 respective composition and removal of the composition
 with water. With respect to Samples VIII and IX, the
 test group reported less drying than Samples VI and VII

although more dryness of the hands was noted in comparison to test Sample V. These empirical observations lead Applicants to conclude that an acidity of at least ph 6.0 is desirable, that is, that the preferred composition should not be more basic than ph 6.0.

To evaluate test compositions for excess acidity, Applicants merely increased the amount of orange oil in test Sample V while holding the amounts of the remaining ingredients constant to obtain desired acidity levels according to Table 8, below:

TABLE 8

Sample	pH (Approximately)
X	2.5
XI	3.0
XII	3.5
XIII	4.0

Test Sample X had a volume percent of approximately 80% orange oil, Sample IX had orange oil of approximately 70% by volume, Sample XII had orange oil of approximately 60% by volume, and Sample XIII had orange oil of approximately 50% by volume.

It had previously been found that orange oil alone exhibited excellent cleaning properties, but left the hands feeling too dry and too astringent. With respect

to Samples X-XIII, in each case no emulsion formed. The test group reported that each of Samples X-XIII had excellent cleaning properties, but the emulsions felt too astringent on the hands even after limited use.

5 Applicants accordingly concluded that it was desirable that the emulsified composition have a pH that is approximately 4.5. Thus, Applicants further concluded that the composition according to the preferred embodiment of the present invention should have a pH of
10 between 4.5 and 6.0, inclusively.

As noted in the above examples, the emulsions according to Sample V broke at approximately 38% orange oil by volume. In order to evaluate cleaning properties as a function of percent volume of orange oil,
15 additional samples were prepared wherein the weight percentages of the ingredients other than orange oil was held constant while the amount of orange oil was varied to provide differing volume percentages of orange oil. Accordingly, Samples XIV-XVII were prepared to have
20 volume percents of orange oil approximately 5%, 10%, 15% and 25%, respectively. In each case, the emulsions were stable. These Samples XIV-XVII were given to the test group to subjectively evaluate cleaning effectiveness. With respect to Sample XIV, the test group reported that
25 cleaning properties were substantially reduced; Sample XIV could not effectively clean tar or caulking compounds. Indeed, Sample XIV was only effective in removing cosmetics from the skin. Sample XV eventually

was able to remove silicone caulking compounds but was unable to remove polyurethane caulking or tar. With respect to Sample XVI, the test group reported about 50%-60% of the cleaning effectiveness of Sample V with no marked increase in benefits in skin softening. Sample XVII was reported to have approximately 80% of the cleaning effectiveness of Sample V in removing all of the tested materials, but again there was no report of skin enhancements over Sample V.

From these tests, Applicants concluded that, with respect to cosmetics, a composition according to the present invention could have as little as 5% by volume of orange oil although it was preferable to have a cleaning composition having at least 25% by volume of orange oil.

To determine whether the moisturizers had any effect on the composition or whether pH was the dominant skin effecting property, Applicants prepared yet another sample, Sample XVIII, wherein 100% orange oil was buffered with sodium bicarbonate so that it had a pH of 5.5. This Sample XVIII was tested and it was determined that it was exceptionally drying and astringent on the human hands. Indeed, Sample XVIII proved almost as drying and astringent as Sample X.

In order to increase the amount of orange oil, Applicants further tested a variation on Sample V wherein both the amount of orange oil and the amount of oatmeal were increased while the amount of moisturizers

was decreased. This Sample XIX, was prepared as follows:

SAMPLE XIX

Ingredient	Volume Percent (Approximate)
Orange Oil	40.5
Aloe Vera*	7.75
Jojoba Oil*	7.75
Glycerine	4.5
Safflower Oil*	.5
Oatmeal	89

* Total Moisturizers accounted for 20.5% by volume

From Sample XIX, it was concluded that orange oil could be increased, along with a corresponding increase in an oat grain derivative, until approximately 45% by volume of orange oil was included in the composition. Any amount of orange oil in excess of this amount would result in the diminishment of moisturizers so as to negate the softening effect of the hand cleaning composition according to the preferred invention.

Other samples, set forth below as Samples XX-XXIII were prepared utilizing other materials. These samples are as follows:

SAMPLE XX

Ingredient	Volume Percent (Approximate)
Orange Oil	50
Olive Oil	25
Jojoba Oil	25
Baking Soda	Trace

SAMPLE XXI

<u>Ingredient</u>	<u>Volume Percent</u> <u>(Approximate)</u>
Orange Oil	50
Glycerin	50

SAMPLE XXII

<u>Ingredient</u>	<u>Volume Percent</u> <u>(Approximate)</u>
Orange Oil	50
Aloe Vera	50

SAMPLE XXIII

<u>Ingredient</u>	<u>Volume Percent</u> <u>(Approximate)</u>
Orange Oil	12.5
Vitamin E	87.5

Sample IX was found to have a pH of approximately 8.5. While Sample IX was deemed effective in cleaning, there was some reduction of cleaning effectiveness over Sample V and the composition left a dryness when wiped off of the skin. Further, the emulsion broke almost immediately. With respect to Samples XXI and XXII, both samples left a sticky residue on the hands but were approximately equal in cleaning effectiveness to Sample V. Sample XXI had a pH a little greater than 2.0 while Sample XXII had a pH of approximately 3.5. It was thus observed that aloe vera had some buffering effect on the acidity of the orange oil. Each of Samples XXI and XXII

were highly astringent and left the test groups hands dry after washing with water. With respect to Sample XXIII, again this sample proved effective in removing cosmetics, but the sample was not effect in removing heavier, industrial substances such as caulking compounds, adhesives, tars and the like. The orange oil and Vitamin E, however, did mix without separation and a resulting acidity of pH 5.0.

From the information derived from all of the afore-mentioned samples, Applicants determined that glycerin and safflower oil are both desirable in the preferred compositions. On one hand glycerin appears both to stabilize the emulsion and perform as a moisturizer while, on the other hand, safflower oil appears to act as an emulsion stabilizer, as an emulsifying agent and as a moisturizer.

According to the above, Applicants prefer the compositions set forth in Sample V and Sample XIX for use in cleaning unwanted materials from human skin. In order to test administration of the preferred composition, Applicants applied the compound directly to the skin as a liquid emulsion and removed the emulsion from the hands by washing with water. In addition, Applicants were successful in soaking towelllets, formed of standard absorbent material such as paper, cloth and the like, in the liquid emulsion so that a towellet would become impregnated with the cleaning composition. These towelllets can be hermetically sealed in standard

foil packages, as known in the industry, so that the user can simply remove from the skin any of the described unwanted materials with a pre-moistened towllet. This is particularly useful in situations where water is not readily available. Further, individualized packets of pre-moistened towllets are convenient for portability and on-the-job use.

From the foregoing, the inventors have concluded that a suitable skin cleaning composition can be prepared wherein the skin composition has a first ingredient of between 5% and 60% by volume of orange oil, a second ingredient being a pharmaceutical acceptable moisturizer for human skin and a third ingredient being an emulsifying agent. Preferably, the moisturizer is either one or more of a group of moisturizers selected from the following: glycerin, aloe vera, jojoba oil, safflower oil. However, other pharmaceutically acceptable ^{moisturizers are within} ~~moisturizers with the scope~~ of this invention as could be developed without undue experimentation by the ordinarily skilled chemist according to the teachings of the present invention. One example of such a moisturizer is glycerin ^{stearate,} ~~stearate.~~ These other compositions are thus intended, unless otherwise specifically limited, to be encompassed by the general phrase "moisturizer" both in this specification and in the appended claims. In any event, it is preferred that the resultant composition have a pH between 4.5 to 6.0 and can be so buffered if necessary

by the utilization of aloe vera or a buffering agent,
such as baking soda.

Accordingly, the present invention has been
described with some degree of particularity directed to
5 the preferred embodiment of the present invention. It
should be appreciated, though, that the present
invention is defined by the following claims construed
in light of the prior art so that modifications or
changes may be made to the preferred embodiment of the
10 present invention without departing from the inventive
concepts contained herein.

Am. Pk. Obs.:

Obs. 1

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We Claim:

1. A skin cleaning composition adapted for external use on human tissues, comprising a first ingredient being between five percent (5%) and sixty percent (60%) by volume of orange oil, a second ingredient being a pharmaceutically acceptable moisturizer for human skin and a third ingredient being an emulsifying agent.

2. A skin cleaning composition according to Claim 1 wherein said moisturizer is selected from a group consisting of: glycerin, aloe vera, jojoba oil, and safflower oil.

3. A skin cleaning composition according to Claim 1 wherein said emulsifying agent is an oat grain derivative product.

4. A skin cleaning composition according to Claim 3 wherein said oat grain derivative product is one of oat gum and oatmeal.

5. A skin cleaning composition according to Claim 1 wherein said first, second and third ingredients are selected and mixed in a ratio such that the resulting skin cleaning composition has a pH range of between 4.5 to 6.0, inclusively.

6. A skin cleaning composition according to Claim 1 including as a fourth ingredient a buffering compound in a proportion such that the resulting composition is

pH balanced within a range of 4.5 to 6.0, inclusively.

7. A skin cleaning composition for external use on human tissues, comprising orange oil, a pharmaceutically acceptable moisturizer for human skin and an emulsifying agent, wherein said composition has a pH within a range of 4.5 to 6.0, inclusively.

5. ~~17. 18~~ A skin cleaning composition according to claim 7 including a buffering compound.

5. ~~8. 11~~ A skin cleaning composition according to claim 7 wherein said moisturizer is selected from a group consisting of: glycerin, aloe vera, jojoba oil, safflower oil and glycerol ^{stearate} ~~stearate~~.

10. A skin cleaning composition according to claim 7 wherein said emulsifying agent is an oat grain derivative product.

11. A cleaning composition for use on human skin comprising forty-five percent (45%) or less by volume of orange oil, forty-five percent (45%) or less by volume of an emulsifying agent, and a pharmaceutically acceptable moisturizer.

12. A cleaning composition according to claim 11 wherein said emulsifying agent is oatmeal.

10. ~~10. 11~~ A cleaning composition according to claim 11 wherein said moisturizer is a mixture of jojoba oil, aloe vera and glycerin.

11. ~~11. 12~~ A cleaning composition according to claim 11 wherein said mixture includes by volume two parts jojoba

oil, two parts aloe vera and one part glycerin.

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12. 15. A cleaning composition according to claim 9 wherein said mixture includes safflower oil.

16. A cleaning product comprising a towallet formed of an absorbent material, said towallet being impregnated with a cleaning composition and hermetically sealed in a packet member wherein said cleaning composition comprises a first ingredient ingredient being between five percent (5%) and sixty percent (60%) by volume of orange oil, a second ingredient being a pharmaceutically acceptable moisturizer for human skin and a third ingredient being an emulsifying agent.

17. A cleaning product comprising a towallet formed of an absorbent material according to Claim 16 wherein said moisturizer is selected from a group consisting of: glycerin, aloe vera, jojoba oil, and safflower oil.

18. A cleaning product comprising a towallet formed of an absorbent material according to Claim 16 wherein said emulsifying agent is one of oat gum and oatmeal.

DECLARATION FOR PATENT APPLICATION

Docket No. 1286

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled CLEANING COMPOSITIONS WITH ORANGE OIL, the specification of which

(check one) ☒ is attached hereto.

☐ was filed on _____ as
Application Serial No. _____
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)			Priority Claimed	
(Number)	(Country)	(Day/Month/Year Filed)	Yes	No
_____	_____	_____	Yes	No
_____	_____	_____	Yes	No
_____	_____	_____	Yes	No

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.) _____	(Filing Date) _____	(Status-patented, pending, abandoned) _____
(Application Serial No.) _____	(Filing Date) _____	(Status-patented, pending, abandoned) _____

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

301
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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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